

AMENDMENTS TO THE CLAIMS:

Claim 1. (Currently amended) An in-plane switching type liquid crystal display unit comprising:

a pair of substrate structures comprising ~~having~~ at least plural pixel electrodes and a common electrode on one of said ~~the~~ substrate structures ~~thereof~~, and

a liquid crystal layer sandwiched between said substrate structures and having a splay first elastic coefficient ~~concerning a deformation like a spray pattern and fallen~~ falling within the range expressed as:

6 pico-newton < said splay first elastic coefficient < 25 pico-newton for
improving a luminance of said in-plane switching type liquid crystal display unit.

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Claim 2. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 1, in which the liquid crystal of said liquid crystal layer has a positive anisotropy of dielectric constant.


Claim 3. (Currently amended) The in-plane switching type liquid crystal display unit as set forth in claim 1, in which said liquid crystal further has a bend ~~second~~ elastic coefficient ~~concerning a deformation like a bend line and a~~ twist ~~third~~ elastic coefficient ~~concerning a twist deformation~~, and said splay first elastic coefficient, said bend ~~second~~ elastic coefficient and said twist ~~third~~ elastic coefficient satisfy an inequality expressed as:

$$0.5 < (\sqrt{K_{11} \times K_{33}} / K_{22}) < 2.0$$

where K_{11} is said splay first elastic coefficient, K_{33} is said bend ~~second~~ elastic coefficient and K_{22} is said twist ~~third~~ elastic coefficient.

Claim 4. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 1, in which said substrate structures are spaced from each other by a distance ranging from 1.0 micron to 6.0 microns.


Claim 5. (Currently amended) The in-plane switching type liquid crystal display unit as set forth in claim 1, in which an electric field is created between each of said plural pixel electrodes and a part of said common electrode under application of a potential difference therebetween, and ~~said~~ each of said plural pixel electrodes is spaced from ~~and~~ said part of said common electrode in a direction parallel to inner surfaces of said substrate structures by a distance ranging from 2 microns to 15 microns.

 Claim 6. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 1, in which said substrate structures are spaced from each other by a first distance ranging from 1.0 micron to 6.0 microns, and each of said plural pixel electrodes and an associated part of said common electrode is spaced from each other in a direction parallel to inner surfaces of said substrate structures by a second distance ranging from 2 microns to 15 microns.

Claim 7. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 1, in which said plural pixel electrodes, parts of said common electrode respectively associated with said plural pixel electrodes and pieces of said liquid crystal layer respectively overlapped with combinations of said plural pixel electrodes and said parts form in combination plural pixels arranged in a matrix.

Claim 8. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 7, further comprising color filters selectively put in the primary three colors and contained in said plural pixels, respectively.

Claim 9. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 8, in which said plural pixel electrodes and said common electrode are formed on said one of said substrate structures together with data lines and thin film transistors selectively connected between said data lines and said pixel electrodes, and said color filters are formed on the other of said substrate structures together with a black matrix.

 Claim 10. (Currently amended) An in-plane switching type liquid crystal display unit comprising:

a pair of substrate structures comprising having at least plural pixel electrodes and a common electrode on one of the substrate structures thereof, and

a liquid crystal layer sandwiched between said substrate structures and having a bend first elastic coefficient ~~concerning a deformation like a bent line and fallen~~ falling within the range expressed as:

5 pico-newton < said bend first elastic coefficient < 20 pico-newton for improving a luminance of said in-plane switching type liquid crystal display unit.

Claim 11. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 10, in which the liquid crystal of said liquid crystal layer has a positive anisotropy of dielectric constant.

Claim 12. (Currently amended) The in-plane switching type liquid crystal display unit as set forth in claim 10, in which said liquid crystal further has a splay ~~second~~ elastic coefficient ~~concerning a deformation like a spray pattern~~ and a twist ~~third~~ elastic coefficient ~~concerning a twist deformation~~, and said bend ~~first~~ elastic coefficient, said splay ~~second~~ elastic coefficient and said twist ~~third~~ elastic coefficient satisfy an inequality expressed as:

$$0.5 < (\sqrt{-(K_{11} \times K_{33})} / K_{22}) < 2.0$$

where K_{11} is said splay ~~second~~ elastic coefficient, K_{33} is said bend ~~first~~ elastic coefficient and K_{22} is said twist ~~third~~ elastic coefficient.

Claim 13. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 10, in which said substrate structures are spaced from each other by a distance ranging from 1.0 micron to 6.0 microns.

Claim 14. (Currently amended) The in-plane switching type liquid crystal display unit as set forth in claim 10, in which an electric field is created between each of said plural pixel electrodes and a part of said common electrode under application of a potential difference therebetween, and ~~said~~ each of said plural pixel electrodes is spaced from ~~and~~ said part of said common electrode in a direction parallel to inner surfaces of said substrate structures by a distance ranging from 2 microns to 15 microns.

Claim 15. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 10, in which said substrate structures are spaced from each other by a first distance ranging from 1.0 micron to 6.0 microns, and each of said plural pixel electrodes and an

associated part of said common electrode is spaced from each other in a direction parallel to inner surfaces of said substrate structures by a second distance ranging from 2 microns to 15 microns.

Claim 16. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 10, in which said plural pixel electrodes, parts of said common electrodes respectively overlapped with combinations of said plural pixel electrodes and said parts form in combination plural pixels arranged in a matrix.

Claim 17. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 16, further comprising color filters selectively put in the primary three colors and contained in said plural pixels, respectively.

Claim 18. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 17, in which said plural pixel electrodes and said common electrode are formed on said one of said substrate structures together with data lines and thin film transistors selectively connected between said data lines and said pixel electrodes, and said color filters are formed on the other of said substrate structures together with a black matrix.


Claim 19. (Currently amended) An in-plane switching type liquid crystal display unit comprising:

a pair of substrate structures comprising having at least plural pixel electrodes and a common electrode on one of ~~the~~ said substrate structures ~~thereof~~; and

a liquid crystal layer sandwiched between said substrate structures and having a splay ~~first~~ elastic coefficient ~~concerning a deformation like a spray pattern~~ and a bend ~~second~~ elastic coefficient ~~concerning a deformation like a bent line~~, the square root of the product between said splay ~~first~~ elastic coefficient and said bend ~~second~~ elastic coefficient ~~being~~ ~~fallen~~ falling within the range expressed as:

$$5 \text{ pico-newton} < \text{SQRT} < 20 \text{ pico-newton}$$

where SQRT is said square root of the product between said splay ~~first~~ elastic coefficient and said bend ~~second~~ elastic coefficient for improving a luminance of said in-plane switching type liquid crystal display unit.

 Claim 20. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 19, in which the liquid crystal of said liquid crystal layer has a positive anisotropy of dielectric constant.


Claim 21. (Currently amended) The in-plane switching type liquid crystal display unit as set forth in claim 19, in which said liquid crystal further has a twist ~~third~~ elastic coefficient ~~concerning a twist deformation~~, and said splay ~~first~~ elastic coefficient, said bend ~~second~~ elastic coefficient and said twist ~~third~~ elastic coefficient satisfy an inequality expressed as:

$$0.5 < (\sqrt{K_{11} \times K_{33}}) / K_{22} < 2.0$$

where K_{11} is said splay ~~first~~ elastic coefficient, K_{33} is said bend ~~second~~ elastic coefficient and K_{22} is said twist ~~third~~ elastic coefficient.

Claim 22. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 19, in which said substrate structures are spaced from each other by a distance ranging from 1.0 micron to 6.0 microns.

Claim 23. (Currently amended) The in-plane switching type liquid crystal display unit as set forth in claim 19, in which an electric field is created between each of said plural pixel electrodes and a part of said common electrode under application of a potential difference therebetween, and ~~said~~ each of said plural pixel electrodes is spaced from ~~and~~ said part of said common electrode in a direction parallel to inner surfaces of said substrate structures by a distance ranging from 2 microns to 15 microns.

 Claim 24. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 19, in which said substrate structures are spaced from each other by a first distance ranging from 1.0 micron to 6.0 microns, and each of said plural pixel electrodes and an associated part of said common electrode is spaced from each other in a direction parallel to inner surfaces of said substrate structures by a second distance ranging from 2 microns to 15 microns.

Claim 25. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 19, in which said plural pixel electrodes, parts of said common electrode respectively associated with said plural pixel electrodes and pieces of said liquid crystal layer respectively overlapped with combinations of said plural pixel electrodes and said parts form in combination plural pixels arranged in a matrix.

Claim 26. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 25, further comprising color filters selectively put in the primary three colors and contained in said plural pixels, respectively.

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Claim 27. (Original) The in-plane switching type liquid crystal display unit as set forth in claim 26, in which said plural pixel electrodes and said common electrode are formed on one of said substrate structures together with data lines and thin film transistors selectively connected between said data lines and said pixel electrodes, and said color filters are formed on the other of said substrate structures together with a black matrix.
